

PI-P Programmable Isolating Potentiometer Transmitter.

Programmable Isolating 3 Wire Potentiometer Input to DC Current or DC Voltage Output Transmitter.

Features.

- Field Programmable Input and Output Ranges.
- Bi-Polar Output Ranges.
- Isolated Input to Output 1.6kV.
- High Accuracy 0.1%.
- Universal AC/DC Power Supply.
- Selectable 3second Input Damping.
- Compact DIN Rail Mount Enclosure.
- Available Standard or Special Calibration.



Ordering Information.

PI-P-X Standard Calibration: Input 0~100%; Output 4~20mA;
High Voltage Power Supply.

PI-P - ☐ - ☐ - ☐ - Special Range Special Range Calibration.
IR OR PS

Other PI- models include:
PI-B Bridge / Strain gauge;
PI-D DC; mA, mV, V.
PI-F Frequency;
PI-K Resistance;
PI-M Maths Computing;
PI-N RTD Differential Pt100;
PI-P Potentiometer;
PI-R RTD Pt100;
PI-S Relay Dual Setpoint;
PI-T Thermocouple.

INPUT RANGE (% of POT.)				OUTPUT RANGES			
%POT	IR	%POT	IR	Voltage	OR	Current	OR
0~10%	1	20~40%	16	0~500mV	A	0~1mA	1
0~15%	2	40~60%	17	0~1V	B	0~2mA	2
0~20%	3	60~80%	18	0~2V	C	0~5mA	3
0~25%	4	80~100%	19	0~3V	D	0~10mA	4
0~30%	5	25~50%	20	0~4V	E	0~16mA	5
0~33%	6	50~75%	21	0~5V	F	0~20mA	6
0~40%	7	75~100%	22	0~6V	G	1~5mA	7
0~50%	8	33~67%	23	0~8V	H	2~10mA	8
0~60%	9	67~100%	24	0~10V	I	4~20mA	9
0~67%	10	50~100%	25	0~12V	J	-1~1mA	10
0~70%	11	10~90%	26	1~5V	K	-2~2mA	11
0~75%	12	20~80%	27	2~10V	L	-5~5mA	12
0~80%	13	25~75%	28	-1~1V	M	-10~10mA	13
0~90%	14	30~70%	29	-2~2V	N	-20~20mA	14
0~100%	15	40~60%	30	-5~5V	O		
				-10~10V	P		
				-12~12V	Q		
Special Input Calibration Range			Z	Special Output Calibration Range			Z

POWER SUPPLY		PS
High Voltage Power Supply: 85~264Vac/dc		H
Mid Voltage Power Supply: 22~85Vac/dc		M
Low Voltage Power Supply: 10~28Vac/dc		L

Note: Power supply H is field selectable for M, and M for H. Power supply L must be ordered separately.

Ordering Examples.

- 1/ PI-P-8-1-L 0~50% Input; 0~1mA Output; Low Voltage Power Supply.
- 2/ PI-P-Z-P-H-0/28 0~28% Input; -10~10V Output; High Voltage Power Supply.

Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant long term reliability of the instrument.

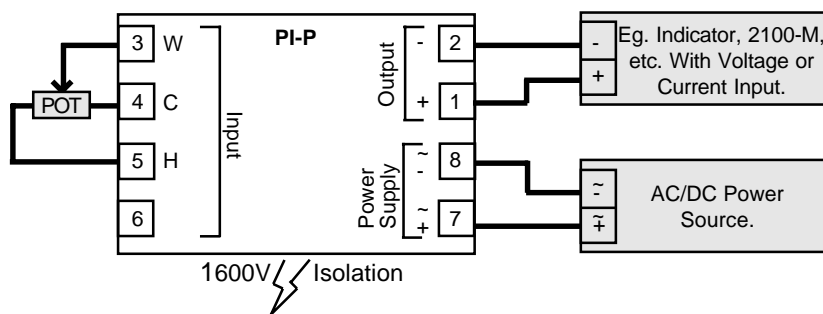
PI-P Rev2 Specifications.

Potentiometer Input	3 Wire Potentiometer.
	Excitation Voltage = 2.5Vdc.
	Minimum Potentiometer Resistance = 200Ω.
	Maximum Potentiometer Resistance = 1MΩ.
	Field Programmable Zero From 0 to 100%.
	Field Programmable Span From 10 to 100%.
Output	-Voltage
	Field Programmable From 500mV to ±12Vdc.
	Maximum Output Drive = 10mA.
	-Current
	Field Programmable From 1 mAdc to ±20mAdc.
	Maximum Output Drive = 10Vdc. (500Ω @ 20mA.)
Power	-H
	85~264Vac/dc; 50/60Hz; 5VA.
	-M
	22~85Vac/dc; 50/60Hz; 5VA.
	-L
	10~28Vac/dc; 50/60Hz; 5VA.
	-Circuit Sensitivity
	<±0.001%/V FSO Typical.
Accurate to	<±0.1% FSO Typical.
Linearity & Repeatability	<±0.1% FSO Typical.
Ambient Drift	<±0.01%/C FSO Typical.
Noise Immunity	125dB CMRR Average. (1600Vdc Limit.)
EMC Compliances	Emissions EN 55022-A. Immunity EN 50082-1, <1% Effect FSO Typical.
Safety Compliance	EN 60950
Mains Isolation	250Vac.
Isolation Test Voltages	Mains to Input/Output 3kVac 50Hz for 1min; Input to Output 1.6kVdc for 1min.
Response Time	200msec Typical. (10 to 90% 50msec Typical.)
Operating Temperature & Humidity	0~60C. (Storage Temp. -20~80C.) 5~85% RH Max. Non-Condensing.
Dimensions and Mounting	L=80, W=50, H=120mm. Mounts on 35mm Symetrical Mounting Rail.

Product Liability. This information describes our products. It does not constitute guaranteed properties and is not intended to affirm the suitability of a product for a particular application. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification. Regrettably, omissions and exceptions cannot be completely ruled out. No liability will be accepted for errors, omissions or amendments to this specification. Technical data are always specified by their average values and are based on Standard Calibration Units at 25C, unless otherwise specified. Each product is subject to the 'Conditions of Sale'.

Warning: These products are not designed for use in, and should not be used for patient connected applications. In any critical installation an independant fail-safe back-up system must always be implemented.

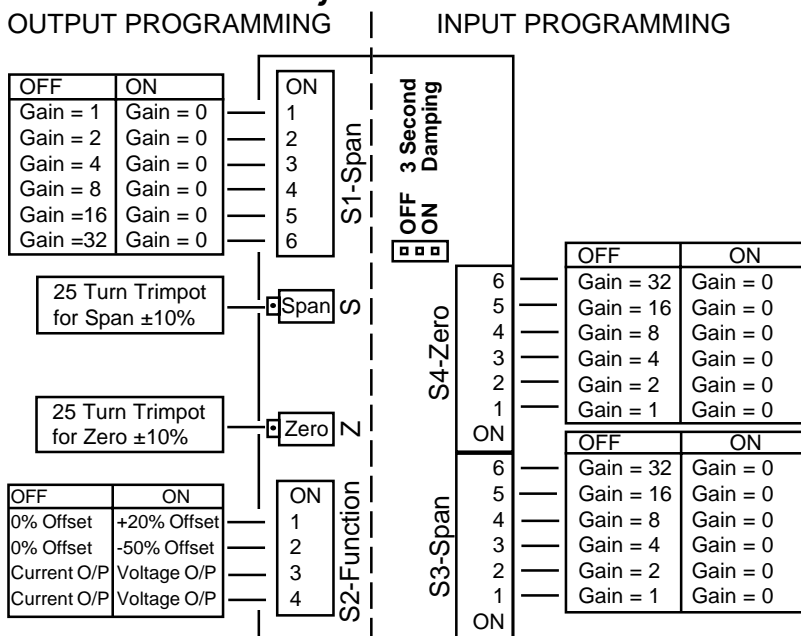
Examples of Input Connection.



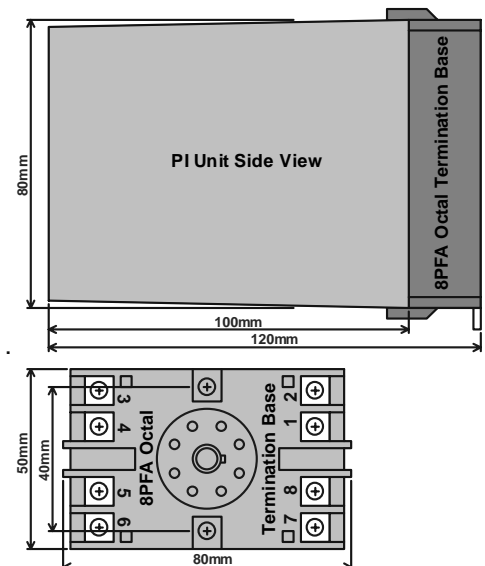
Terminations.

Output	1	+Ve
	2	-Ve
Input	3	WIPER
	4	COM
	5	HIGH
	6	NOT USED
P/S	7	Neutral/+DC
	8	Phase/-DC

Plan View of PI-P Adjustments.



PI-P Dimensions and Mounting.



PI-P Input Programming.

Always set **OUTPUT range first**, then INPUT range.

If the input range is not listed in the programming table, use the following formulae to work out the Zero and Span DIP switch settings for gain.

$$\text{Span Gain} = \frac{600}{\text{POT\% High} - \text{POT\% Low}}$$

$$\text{Zero Gain} = \frac{\text{POT\% Low}}{2}$$

Enter the Zero or Span gain value into the appropriate Zero or Span DIP switch.

Gain Value	1	2	4	8	16	32
DIP Switch No.	1	2	3	4	5	6

So if a gain value of 28 is required, put DIP switch No's 3, 4, 5 OFF (ie, gains of 4 + 8 + 16 = 28) and all the other DIP switches ON. Dip switches and Pots are accessed by removing the small rectangular lid on the top of the PI-P enclosure.

PI-P Input Range Programming Table.

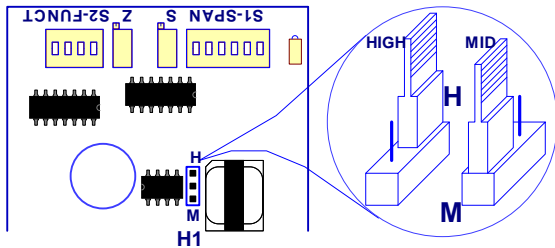
Notes: 1/ Switch status 1 = ON, 0 = OFF, X = DON'T CARE.
2/ Input ranges with '*' beside them require more adjustment by the Zero & Span trimpots.

INPUT RANGE % of POT.	S3-SPAN						S4-ZERO					
	1	2	3	4	5	6	1	2	3	4	5	6
0~10%	1	1	0	0	0	0	1	1	1	1	1	1
0~15%	1	1	1	0	1	0	1	1	1	1	1	1
0~20%	1	0	0	0	0	1	1	1	1	1	1	1
0~25%	1	1	1	0	0	1	1	1	1	1	1	1
0~30%	1	1	0	1	0	1	1	1	1	1	1	1
0~33%	1	0	1	1	0	1	1	1	1	1	1	1
0~40%	0	0	0	0	1	1	1	1	1	1	1	1
0~50%	1	1	0	0	1	1	1	1	1	1	1	1
0~60%	1	0	1	0	1	1	1	1	1	1	1	1
0~67%	0	1	1	0	1	1	1	1	1	1	1	1
0~70% *	0	1	1	0	1	1	1	1	1	1	1	1
0~75%	1	1	1	0	1	1	1	1	1	1	1	1
0~80% *	1	1	1	0	1	1	1	1	1	1	1	1
0~90%	0	0	0	1	1	1	1	1	1	1	1	1
0~100% *	1	0	0	1	1	1	1	1	1	1	1	1
20~40%	1	0	0	0	0	1	1	0	1	0	1	1
40~60%	1	0	0	0	0	1	1	1	0	1	0	1
60~80%	1	0	0	0	0	1	1	0	0	0	0	1
80~100%	1	0	0	0	0	1	1	1	1	0	1	0
25~50% *	1	1	1	0	0	1	0	1	0	0	1	1
50~75%	1	1	1	0	0	1	0	1	1	0	0	1
75~100%	1	1	1	0	0	1	1	0	0	1	1	0
33~67% *	1	0	1	1	0	1	0	1	1	1	0	1
67~100%	1	0	1	1	0	1	1	0	1	1	1	0
50~100%	1	1	0	0	1	1	0	1	1	0	0	1
10~90% *	1	1	1	0	1	1	0	1	0	1	1	1
20~80%	1	0	1	0	1	1	1	0	1	0	1	1
25~75% *	1	1	0	0	1	1	0	1	0	0	1	1
30~70%	0	0	0	0	1	1	0	0	0	0	1	1
40~60%	1	0	0	0	0	1	1	1	0	1	0	1

PI-P H1 Power Supply Jumper Settings.



WARNING: High Voltages Maybe Present.
Only adjust jumper with power disconnected.



Power Supply Jumper Settings	
H1	Power Supply Voltage Range
H	Link for High: 85~264Vac/dc
M	Link for Mid: 22~85Vac/dc

Notes:

- 1/ H1 is approx 4cm (1½") behind the 'S' trimpot.
- 2/ Exceeding voltage ranges may damage the unit.
- 3/ Ensure the enclosure label is correctly labelled for the jumper position.
- 4/ Adjust H1 jumper with a pair of needle nose pliers.
- 5/ Low Voltage Power Supply version is fixed, and has no jumper.
This must be ordered separately.

Output Range Programming Table.

- Notes:
- 1/ Switch Status 1 = ON 0 = OFF.
 - 2/ Output Ranges with '*' beside them reverse the polarity of the output connections.

Output Range (V)	S1-SPAN						S2-Function				Output Range (I)	S1-SPAN						S2-Function			
	1	2	3	4	5	6	1	2	3	4		1	2	3	4	5	6	1	2	3	4
0~500mV	0	1	1	1	1	1	0	0	1	1	0~1mA	0	1	1	1	1	1	0	0	0	0
0~1V	1	0	1	1	1	1	0	0	1	1	0~2mA	1	0	1	1	1	1	0	0	0	0
0~2V	1	1	0	1	1	1	0	0	1	1	0~5mA	0	1	0	1	1	1	0	0	0	0
0~3V	1	0	0	1	1	1	0	0	1	1	0~10mA	1	0	1	0	1	1	0	0	0	0
0~4V	1	1	1	0	1	1	0	0	1	1	0~16mA	1	1	1	1	0	1	0	0	0	0
0~5V	1	0	1	0	1	1	0	0	1	1	0~20mA	1	1	0	1	0	1	0	0	0	0
0~6V	1	1	0	0	1	1	0	0	1	1	1~5mA	1	1	0	1	1	1	1	0	0	0
0~8V	1	1	1	1	0	1	0	0	1	1	2~10mA	1	1	1	0	1	1	1	0	0	0
0~10V	1	1	0	1	0	1	0	0	1	1	4~20mA	1	1	1	1	0	1	1	0	0	0
0~12V	1	1	1	0	0	1	0	0	1	1	-1~1mA	1	0	1	1	1	1	0	1	0	0
1~5V	1	1	1	0	1	1	1	0	1	1	-2~2mA	1	1	0	1	1	1	0	1	0	0
2~10V	1	1	1	1	0	1	1	0	1	1	-5~5mA	1	0	1	0	1	1	0	1	0	0
-1~1V	1	1	0	1	1	1	0	1	1	1	-10~10mA	1	1	0	1	0	1	0	1	0	0
-2~2V	1	1	1	0	1	1	0	1	1	1	-20~20mA	1	1	1	0	1	0	0	1	0	0
-5~5V	1	1	0	1	0	1	0	1	1	1	0~-10mA *	1	0	1	0	1	1	0	0	0	0
-10~10V	1	1	1	0	1	0	0	1	1	1	0~-20mA *	1	1	0	1	0	1	0	0	0	0
-12~12V	1	1	1	1	0	0	0	1	1	1											
0~-5V *	1	0	1	0	1	1	0	0	1	1											
0~-10V *	1	1	0	1	0	1	0	0	1	1											

The Proper Installation & Maintenance of PI-P.

Note. All power and signals must be de-energised before connecting any wiring, altering any jumpers or DIP switches, or inserting or removing the PI unit from its base.

MOUNTING.

- (1) Mount in a clean environment in an electrical cabinet on 35mm, symmetrical, mounting rail.
- (2) Draft holes must have minimum free air space of 20mm. Foreign matter must not enter or block draft holes.
- (3) Do not subject to vibration or excess temperature or humidity variations.
- (4) Avoid mounting in cabinets with power control equipment.
- (5) To maintain compliance with the EMC Directives the PI-P is to be mounted in a fully enclosed steel cabinet. The cabinet must be properly earthed, with appropriate input / output entry points, filtering, and cabling.

WIRING.

- (1) A readily accessible disconnect device and a 1A, 250Vac overcurrent device, must be in the power supply wiring.
- (2) All cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only.
- (3) Signal cables should be laid a minimum distance of 300mm from any power cables.
- (4) For 2 wire current loops Austral Standard Cables B5102ES is recommended. For three wire transmitters, RTD's and Resistance Probes, Austral Standard Cables B5103ES 1A, 250Vac overcurrent is recommended.
- (5) It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
- (6) Lightning arrestors should be used when there is a danger from this source.
- (7) Refer to diagrams for connection information.

COMMISSIONING.

- (1) Once all the above conditions have been carried out and the wiring checked apply power to the PI-P loop and allow five minutes for it to stabilize.
- (2) Due to cable resistance and errors within the potentiometer itself a small error may occur (usually less than 1%). To remove this error adjust the Zero and Span trim pots in the top of the PI-P enclosure with a small screwdriver. (Clockwise to increase the output reading and anticlockwise to decrease the output reading)
- (3) Take a low (approx 10%) and high (approx 90%) reading of the variable being measured by the transducer supplying the signal to the PI-P, and ensure that this agrees with the level being indicated by the PLC or indicator, etc, that the PI-P is connected into. Adjust for any difference using the Zero & Span Pots in the top of the PI-P enclosure with a small screw driver until the two levels agree. (Clockwise to increase the output reading and anti-clockwise to decrease the output reading.)

MAINTENANCE.

- (1) Repeat (3) of the commissioning instructions.
- (2) Do it regularly - at least once every 12 months.

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